

**ABSTRACT OF THE DISCLOSURE**

- An optical retimer is provided that retimes an optical data signal entirely in the optical domain, thus eliminating the need for optical-to-electrical and electrical-to-optical converters, which are needed to perform retiming in the electrical domain.
- 5     Eliminating these conversion steps also eliminates, or at least decreases, the potential for errors in the retimed optical signal, such as jitter. The optical retimer samples the optical data signal during a clock cycle that has been determined by clock recovery, allows the sampled signal to traverse an optical pathway for the remainder of the cycle, out-couples a fraction of the sampled optical signal each time the signal
- 10    traverses the optical pathway, and amplifies the signal traversing the pathway to maintain the signal at the power level it had when it was sampled. By the end of the clock cycle, the out-coupled signal corresponds to a retimed version of the original signal, synchronized to the recovered clock signal.

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